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In his Sept. 29 State of the Lab address,

JPL Director Dr. Charles Elachi declared the upcoming year

“a very challenging time, but an exciting time in the history of JPL.”

Elachi: ‘Exciting’ year to come

By Mark Whalen

Elachi congratulated the GALEX, Mars Exploration Rover and SIRTf teams on the great effort to successfully launch four spacecraft in a five-month period. All four missions are operating well.

Elachi also congratulated the Galileo team on its recently completed mission, lauding their “vision and tenacity.”

“Even with Galileo gone,” he pointed out, “we still have 17 spacecraft and four major instruments in operation across the solar system. We all should take pride in the richness of the science

derstand mistakes that happen at other places, and shame on us if we repeat any of those.”

In noting that JPL should nurture a culture of “openness, responsibility and courage,” he said, “When we see a problem, it is our responsibility to bring it up to the next layer of management, and if it’s not addressed, to bring it up to the next layer, and so on. We should never be intimidated.

“On the other side, I expect management to respect people when they bring

will develop implementation guidelines, while the Project and Engineering Management Council will identify critical technical areas and ensure that approaches are implementable.

The Lab will receive an additional boost with Elachi’s announced investment in its burden budget for the near term. Highlights include:

- The Research and Technology Development area will increase from \$10 million in FY ’03 to \$25 million in ’04, then to \$35 million in ’05 and \$45 million in ’06.
- An increase of \$8.8 million for JPL’s technical infrastructure and \$3.8 million for an information infrastructure upgrade.
- The new Human Resource Development Fund (\$2.5 million for FY ’04, trending to \$15 million in a few years) will allow JPL to annually hire at least 25 “fresh-outs,” within three years of graduation; hire staff in specific disciplines for critical areas such as astrophysics, system engineering, and planetary and Earth science; and conduct joint appointments with local universities, including Caltech, USC, UCLA and others.
- A \$2 million business investment for a system to allow for enterprise resource planning and integrate it with the Lab’s engineering and design processes as well as manufacturing and inventory processes.
- \$4 million to the Microdevices Laboratory, to upgrade equipment.

In total, the additions represent an increase for investment from 21 to 26% of JPL’s burden budget. “This is very critical,” Elachi said. “I felt that these investments were essential to the long-term health of the Lab.”

As soon as the budget is approved, JPL could face some growth in personnel. Elachi envisions that JPL will add 100 to 200 work years (the equivalent of 100 to 200 full-time employees) in the next year. To accommodate that, the Lab is considering renting 200 to 300 workspaces in the Pasadena area over the next year.

For the long term, JPL has developed a 10-year master plan, which includes the construction of three major buildings and possibly an education center. The first building, a flight project center, is slated to start a year from now and will provide 500 to 600 offices.

In closing, Elachi told the gathering, “In this 45th anniversary of NASA, we can all be proud of what JPL has accomplished for the nation and humankind as part of the NASA team.”

Elachi’s address is archived at <http://dailyplanet.net>.



Tom Wynne / JPL Photo Lab

coming from these spacecraft.”

The new fiscal year began Oct. 1, and in terms of a new budget, “things are looking optimistic for NASA,” Elachi said, noting that the House and Senate have passed their bills but have not yet met for a final bill.

The president’s request for FY ’04 is projected to be about \$15.5 billion, with a sum of close to \$18 billion in five years. “That’s pretty good, considering the economic situation we’re in,” he said.

For space science, the president’s FY ’04 request is approximately \$4 billion, with a five-year projection of \$5.6 billion, an annual growth of about 7%. In the Earth Science area, the president’s ’04 request is about \$1.5 billion, down from FY ’03, “but the trend for the future is on the positive side,” Elachi said. “There is a small drop between ’04 and ’05, but then it will pick up.”

What are the implications for JPL? For the near term, Elachi said the Lab’s projected budget for FY ’04, if enacted, shows a net growth of about 10%. “Effectively, between the House and Senate, all of our future missions have been approved, with very minor perturbations,” he said.

To help the Lab achieve its goals, Elachi stressed the importance of “lessons learned.” “Smart people learn from their mistakes, but brilliant people learn from other people’s mistakes,” he said. “It’s very important for us to un-

derstand mistakes that happen at other places, and shame on us if we repeat any of those.”

In light of the aforementioned lessons learned and the Columbia Accident Investigation Board’s recent report, NASA is forming an Engineering and Safety Center, a “virtual team” that includes staff from all NASA centers. Based at Langley Research Center, the team will provide an additional step of checks and balances—“not to wait until problems happen, but to bring an external perspective from talent both inside and outside the agency,” Elachi noted.

“This is an example of how we all should work as a team to help the agency achieve its goals,” he said. He told the audience about a “One NASA” meeting that will be held at JPL Oct. 17 (see page 3 article).

The director described a slight shift in focus for the Lab in its implementation strategy. The former plan was to always have one in-house mission in progress at JPL; now the goal is to have one large and one small- or medium-sized mission always in development.

In addition, the Lab will implement in-house strategic subsystem elements of projects subcontracted to industry; implement several remote-sensing and in-situ instruments in house; and select missions, subsystems and instruments early in the mission definition process.

The Strategic Management Council

Benefits enrollment starts Oct. 15

FROM OCT. 15–31, employees will be able to select their benefit options for 2004. The *Benefits@Caltech* newsletters sent out in September and early October discussed important changes in the benefits program effective Jan. 1. These changes include:

- Replacing the Blue Cross and CIGNA plans with Health Net Paid Provider Organization and Health Maintenance Organization options.
- Introducing a new basic Long-Term Disability plan providing 40% income replacement during long-term disabilities.
- Providing a new employee plus child(ren) medical and dental coverage option.

Enrollment instructions and a detailed Comparison of Benefits chart will be mailed to employees’ home addresses prior to Oct. 15.

This year, it’s important to review enrollment materials and verify your dependent data online. In addition, if you are transitioning to the Health Net HMO plan it’s also important to review the primary care provider data online (www.healthnet.com/caltech) to ensure that you are assigned the correct provider.

For a list of enrollment meetings to be held this month, see page 2. For enrollment questions, contact the JPL Benefits Office at ext. 4-3760.

Get tickets for Family Day, set for Nov. 1

JPL FAMILY DAY WILL BE HELD Saturday, Nov. 1. Tickets are required, and are available through Oct. 17. All JPL badge holders and their immediate families may attend.

Family Day will be held from 10 a.m. to 3 p.m. Lunch and entertainment will be provided in the mall, and it’s a great opportunity for your family to see your workplace up close. Activities and tour sites include a Mars Exploration Rover mission exhibit, Cassini mission exhibit and planetarium show, von Kármán visitor center, Space Flight Operations Facility, JPL Store, Welcome to Outer Space movie, Child Educational Center and Caltech Credit Union.

Tickets are available at the JPL Store, Building 114-104; Human Resources, 180-502; Public Services, 186-113; credit union, 218; Mars Exploration Program, 264-640E; and Employee Services and Recognition, 310-203.

For more information, call Nancy Kapell at ext. 4-9432.

“...We all should work as a team to help the agency achieve its goals.”



News Briefs



Dr. Ayanna Howard



Dr. Claudia Alexander

Howard named top young innovator
DR. AYANNA HOWARD, a senior member of the technical staff with the Telerobotics Research and Applications Group in Section 348, has been named one of the world's top young innovators by Technology Review magazine.

The "TR100" is a group of 100 creative individuals under age 35 "whose work is transforming the nature of such fields as biotechnology, computing, energy, medicine, manufacturing, nanotechnology, telecommunications, and transportation," the magazine said. Technology Review editors and a panel of judges chose the group from nearly 650 candidates.

Howard and the other honorees are profiled in the October issue of Technology Review magazine. They received the award at last month's Emerging Technologies Conference at the Massachusetts Institute of Technology.

With JPL since 1991, Howard's expertise is in neural networks, robotics, fuzzy logic, and machine vision. She has published more than 40 journal articles, conference papers, and book chapters on the successful use of artificial intelligence techniques, from intelligent terrain assessment algorithms to autonomous rover navigation.

She is a past winner of JPL's Lew Allen Award for Excellence in Research, the Lab's highest honor in recognition of significant leadership and technological innovation performed during the early years of an employee's professional career.

Women of color award to Alexander
JPL research scientist DR. CLAUDIA ALEXANDER is a recipient of an Emerald Honor for Women of Color in Research & Engineering. The award, given by Career Communications Group, Inc., is the publisher of Black Engineer & Information Technology Magazine.

The award was presented in September at the National Women of Color Research Sciences and Technology Conference in Nashville, Tenn. The annual conference celebrates the contributions of minority women in science and technology.

Alexander was one of the project

managers of JPL's Galileo mission to Jupiter, which ended Sept. 21. She is also a project scientist for the U.S. role in the European Space Agency's Rosetta mission to a comet.

Parking changes for 2004 noted
JPL Security has announced the following issues affecting parking policies for next year:

- *Performance-Based parking returns in 2004.* Each Directorate received allocations for awarding on-Lab parking privileges to JPL employees for excellent performance. Recipients of Performance-Based parking will be notified by their supervisor or manager. Individuals will be issued parking hang tags in December that will be valid between Jan. 5, 2004 and Jan. 2, 2005. Performance hang tags issued in 2003 will not be valid in calendar year 2004.

- *Lottery Parking will be suspended in 2004.* In light of the demands of Mars Exploration Rovers, Stardust, Space Infrared Telescope Facility and other projects—along with the associated influx of affiliates, partners, and visitors in the first part of 2004—an on-Lab parking lottery will be delayed and evaluated later in the calendar year. Current Lottery parking hang tags will expire in January 2004.

- Employees who obtain the designation of Senior A will have been notified by their supervisor or manager between Sept. 22 and Oct. 10. Newly designated Senior A's will be eligible to park on-Lab in unassigned spaces beginning Jan. 5, 2004. Hang tags will be issued by the Parking Office prior to the new year.

- Employees who reach 25 years of continuous JPL service are eligible for on-Lab colored parking effective on their anniversary date. Similarly, regular promotions to Principal, Manager I, and other qualifying positions are eligible for hang tags on the effective date of the promotion.

- All other on-Lab parking eligibility criteria and special parking pass programs (Project, Expeditor, Special Visitor, Medical and Carpool) will remain unchanged.

CloudSat radar shipped for integration



Bob Brown / JPL Photo Lab

The CloudSat spacecraft's Cloud Profiling Radar has been shipped from JPL's Spacecraft Assembly Facility to Ball Aerospace in Boulder, Colo. Over the next several months Ball and JPL engineers will integrate the radar into the spacecraft, and a series of environmental tests will be conducted.

The Cloud Profiling Radar was developed by JPL with partnership and hardware contributions from the Canadian Space Agency. The High Power Assembly subsystem of the radar remains at JPL for thermal-vacuum testing. When this testing is satisfactorily completed later this year, the subsystem will be shipped to Ball, where it will be integrated into the Cloud Profiling Radar.

CloudSat, an Earth System Science Pathfinder mission that will launch in 2005, will study clouds in detail to better characterize the role they play in regulating the Earth's climate. CloudSat is a joint U.S./Canadian mission intended to provide a global survey of cloud properties. CloudSat data will lead to improved representation of clouds in weather and climate models, and should improve the accuracy of weather forecasts and climate predictions.

CloudSat will fly in on-orbit formation as part of the "A-Train," a constellation of six satellites in Earth orbit that will cross the equator within a few seconds to minutes of one another at around 1:30 p.m. local time.

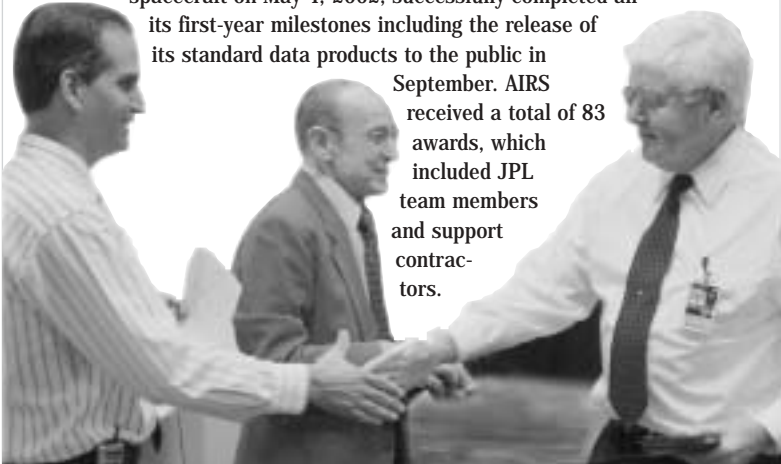


Goddard honors JPL's AIRS team

Fred O'Callaghan (right), former AIRS project manager and current program manager of the Astronomy and Fundamental Physics Experiments Program (720), receives his award from AIRS project manager Tom Pagano (left) and AIRS science team leader Dr. Mustafa Chahine

NASA Goddard Space Flight Center recently honored members of JPL's Atmospheric Infrared Sounder (AIRS) team with group achievement awards for outstanding teamwork on the Earth Observing System Aqua mission.

AIRS, an atmospheric sounding system launched onboard the Aqua spacecraft on May 4, 2002, successfully completed all its first-year milestones including the release of its standard data products to the public in September. AIRS received a total of 83 awards, which included JPL team members and support contractors.



to courtesy of Sharon Okonek

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meetings are available. Call the Employee Assistance Program at ext. 4-3680 for time and location.

Caregivers Support Group—Meets the first Thursday of the month at noon in Building 167-111 (The Wellness Place). For more information, call the Employee Assistance Program at ext. 4-3680.

Codependents Anonymous—Meeting at noon every Wednesday. Call Occupational Health Services at ext. 4-3319.

Gay, Lesbian and Bisexual Group—Meets the first Friday and third Thursday of the month at noon in Building 111-117. Call the Employee Assistance Program at ext. 4-3680 or Randy Herrera at ext. 3-0664.

Parents Group for Children With Special Needs—Meets the second Thursday of the month at noon in Building 167-111.

Working Parents Support Group—Meets the third Thursday of the month at noon in Building 167-111. For more information, call the Employee Assistance Program at ext. 4-3680.

Tuesday, October 14

JPL Stamp Club—Meeting at noon in Building 183-328.

"Remembering the Past, Imaging the Future: Diagnosing and Treating Alzheimer's Disease"—This free event will be held in Beckman Auditorium at 8 p.m. Panelists will present the latest innovations in imaging techniques for visualizing pathology in the brains of Alzheimer's patients. They will discuss how this will impact the diagnosis of Alzheimer's, present ideas for predicting Alzheimer's in presymptomatic individuals, and talk about the newest methods for treating this disorder and treatments on the horizon. For more information, call (626) 395-4652.

Wednesday, October 15

"Viruses, Viruses, Viruses"—Caltech president Dr. David Baltimore will deliver this free lecture at 8 p.m. in Beckman Auditorium. For more information, call (626) 395-4652.

Thursday, October 16

JPL Hiking+ Club—Nonmembers are invited to stop by the Building 301 patio at noon to discuss membership information.

NASA Honor Awards Ceremony—The annual event to honor JPL staff will be held from 9:30 to 11 a.m. in the mall.

TIAA/CREF Enrollment Meeting—This workshop, held at noon in T1720-137, is designed to assist employees newly

eligible for the Caltech/JPL retirement plan with selection of investment options and completion of enrollment forms.

Thu.-Fri., October 16-17

Von Kármán Lecture Series—JPL astrophysicist Dr. David Meier will present "Cosmic Jets: New Building Blocks of the Universe" at 7 p.m. Thursday in von Kármán Auditorium and Friday in Pasadena City College's Vosloh Forum, 1570 E. Colorado Blvd. Thursday's lecture will be webcast at <http://www.jpl.nasa.gov/events/lectures/oct03.html>.

Friday, October 17

Folk Music—Irish songstress Fil Campbell will appear at Caltech's Winnett Student Lounge at 8 p.m. Tickets are \$15 for adults and \$5 for children under 12. For more information, check the Caltech Folk Music Society site at www.folkmusic.caltech.edu.

Saturday, October 18

The Tweaksters—Two quirky artists explore the laws of physics, then seemingly smash them to bits in a mix of dance, juggling and aerobatics. Held at 2 p.m. in Caltech's Beckman Auditorium. Tickets are \$12 for adults, \$7 for youth. For more information, call (626) 395-4652.

Tuesday, October 21

"A Bayesian View of the Universe: From Massive Data Sets to Physical Understanding"—Dr. Jeff Jewell of the Planck Low-Frequency Instrument Data Analysis Team in Section 367's Data Understanding Systems Group will lecture at noon in the 167 conference room.

Investment Advice—Fidelity will offer one-on-one counseling in T1720-131. For an appointment, call (800) 642-7131.

"Looking Ahead To Retirement"—This workshop from noon to 2 p.m. in Building 180-101 is designed to help participants who are approaching retirement age examine their retirement expenses and income sources and provide strategies to help them close any gaps between the two. It also touches on distribution options during retirement.

Wednesday, October 22

JPL Toastmasters Club—Meeting at 5 p.m. in the 167 conference room. Call Debbie Llata at ext. 3-3690.

"Lies and the Lying Liars Who Tell Them . . . A Fair and Balanced Look at the Right"—Satirist and author Al Franken will read from his new book at 8 p.m. in Caltech's Beckman Auditorium. A book signing will follow. For more information, call (626) 395-4652.

2004 BENEFITS ENROLLMENT MEETINGS

Selecting the appropriate benefit coverage is an important decision. To learn more about your benefit options for 2004, please plan on attending at least one of the following meetings.

An Overview of 2004 Plan Changes

Monday, Oct. 20	3 to 5 p.m.	von Kármán Auditorium
Wednesday, Oct. 22	11 a.m. to 1 p.m.	von Kármán Auditorium
Tuesday, Oct. 28	11 a.m. to 1 p.m.	von Kármán Auditorium
	3 to 5 p.m.	von Kármán Auditorium

Understanding Health Net's Prescription Drug Program

Wednesday, Oct. 22	3 to 5 p.m.	von Kármán Auditorium
Thursday, Oct. 23	3 to 5 p.m.	von Kármán Auditorium
Tuesday, Oct. 28	1:30 to 3 p.m.	167 conference room
Wednesday, Oct. 29	9 to 11 a.m.	167 conference room
	1 to 3 p.m.	167 conference room

Health Net Transition of Care Informational Sessions

Friday, Oct. 24	3 to 5 p.m.	von Kármán Auditorium
Tuesday, Oct. 28	9 to 11 a.m.	167 conference room
Wednesday, Oct. 29	11 a.m. to 1 p.m.	167 conference room
	3 to 5 p.m.	167 conference room

Medical/Dental Plan Question/Answer Sessions

Thursday, Oct. 16	9:30 a.m. to 3 p.m.	Mall
Tuesday, Oct. 21	9:30 a.m. to 3 p.m.	Mall
Friday, Oct. 24	9:30 a.m. to 3 p.m.	Mall
Thursday, Oct. 30	9:30 a.m. to 3 p.m.	Mall



One NASA

Workshops underway agencywide

This article, one in a series that describes how NASA centers are realizing the One NASA goal, was provided by the Kennedy Space Center.



"I think One NASA is all about teamwork. Regardless if you're NASA badged or part of the contractor team, you're part of the NASA team," said Kennedy Space Center Director Jim Kennedy. With those words, Kennedy helped inaugurate the agency's One NASA leader-led workshops Aug. 20.

NASA is embarking on a cultural change emphasizing a strong commitment to teamwork, accessible tools and a greater collaboration across the agency. This forward-thinking leap, which also meets the President's Management Agenda goal to make government more efficient and effective, is known as One NASA.

Following the prior introduction of One NASA concepts, the need for workshops was overwhelmingly expressed in One NASA surveys. Employees sought to better understand the overall strategy and direction of the agency while grappling with their role in that strategy.

The resulting session objectives are to provide an overview of the strategy for the agency, outline accomplishments and future plans for enterprises and centers, highlight how all centers contribute to enterprise plans and agency vision and mission, provide examples of collaboration among enterprises and centers through real-life examples, and share information about various initiatives.

One of 38 One NASA actions was to broaden employees' knowledge of the agency's vision and the initiative, so in response KSC was selected to host the initiative's first leader-led workshops, which opened at the KSC Visitor Complex IMAX Theater. NASA leaders discussed how the agency vision relates to all employees' work objectives. This portion was also aired on NASA TV for those unable to attend.

Kennedy; James Jennings, NASA's associate deputy administrator for institutions and asset management; Ed Weiler, associate administrator for Space Science; Kevin Peterson, Dryden Flight Research Center director; incoming KSC Deputy Director Woodrow Whitlow; and implementation team lead Johnny Stephenson each explained their respective contributions to One NASA.

Stephenson emphasized, "One NASA allows us to accomplish more as a team than ever possible individually."

Breakout sessions provided detailed information about the progress of NASA's ongoing initiatives. Specifically, the gatherings focused on (1) project management; (2) return to flight; (3) President's Management Agenda/Full Cost Accounting; (4) human capital/NASA Shared Services Center; and (5) integrated planning.

Also, these workshops introduce key leaders outside of individuals' own enterprises while simultaneously emphasizing the level of cross-center collaboration underway within NASA. For example, Weiler shared his

knowledge of astronomy to explain to KSC's workforce that thinking out of the box may be difficult but often yields amazing results.

Kennedy, the new director of KSC, helped spearhead the program initially and he's incorporating those leadership ideals into his daily practices.

"Today is a very, very special day," he said. "When you leave here, I hope you feel you've learned a lot and had a chance to celebrate that we're a team."

Dr. Julian Earls presented a refreshing motivational speech during lunch as well. Earls, Glenn Research Center's incoming director, used humorous analogies to express constructive leadership concepts. For example, he explained how the "Tate Family" easily undermines an organization's goals. The notorious family members are Dic Tate, Agi Tate, Hesi Tate and Irri Tate.

"The true significance is not so much what happens here, but what happens when you leave here—because of what happened here," Earls said. "When spider webs unite they can contain a lion."

These activities are just the first of many like it that will prompt discussion and information sharing. Also, additional One NASA information can always be referenced at www.onenasa.nasa.gov.

The panel at the first One NASA workshop, held at the Kennedy Space Center.

JPL's 'One NASA' town hall set for Oct. 17

JPL will hold a One NASA town hall meeting on Friday Oct. 17, from 9 to 10:30 a.m. in von Kármán Auditorium. It will feature Dr. Ghassem Asrar, associate administrator of NASA's Office of Earth Science (Code Y); Johnny Stephenson, the One NASA team lead from NASA Headquarters; Jim Kennedy, director of Kennedy Space Center; and Dr. Charles Elachi, JPL's director. They will discuss how JPL is supporting the One NASA initiative.

The meeting will be followed by two breakout sessions from 10:30 to 11:30 a.m. One meeting, to be held in von Kármán Auditorium, will address the implication of Full Cost Accounting and Integrated Financial Management at JPL. The subject and location of the second breakout session is to be determined. Check the Daily Planet (<http://dailyplanet>) the week of Oct. 13 for more information.

All employees are encouraged to attend and participate in these events.

The Town Hall will be broadcast on the Daily Planet and on JPL TV monitors.



Left to right: Dr. Ghassem Asrar, Jim Kennedy, Johnny Stephenson.

Microthrust propulsion lab opens

By Rima Bedevian

The new Microthrust Propulsion Laboratory opened its doors on Sept. 15 to develop, evaluate and test microthrust propulsion technologies and microspacecraft systems, allowing JPL to become a leader in microthrust technology.

“We will face many challenges, and now we will have the tools to meet those challenges,” said John Ziemer, a senior engineer in the Advanced Propulsion Technology Group (3534).

The 1,000-square-foot facility and test chamber, which are funded through JPL grants and loans, will initially be involved in the Laser Interferometer Space Antenna (LISA) Project, which will directly detect gravitational waves in space, and the Space Technology 7 Disturbance Reduction System

Passings

MICHAEL SCHMELZEL of the Advanced Thermal and Structural Technology Group in Section 3542 died Sept. 8.

Schmelzel had worked at the Lab since 1989. He is survived by his wife JoAnn and sons Curtis, Matthew and Bryant. Funeral arrangements were private.

Letters

My father, surviving brothers, and sister wish to thank Division 33 and Section 336 for your heartfelt prayers, thoughts, kind words of support, and gift basket following the death of my youngest brother Mark. The gift basket was shared with the family and other guests at the celebration of life gathering following the memorial ceremony. Thank you again to all in our JPL family.

Anthony Mittskus

Dear JPL Family: We would like to express our appreciation and gratitude for the generous donations we have received to the Mike Schmelzel Memorial Fund as well as the beautiful plant arrangement. Having experienced such a great loss, we never could have imagined the support and love we have received from everyone at JPL. My children and I would like to thank all of you for the generosity and love you have given to our family through this terrible time; you will never know how much your support has meant to us.

Curtis, Matthew, Bryant and Joanne Schmelzel

I would like to extend a sincere “Thank You” to my friends, co-workers, and JPL/ERC for the beautiful plants, flowers, and cards; and, most of all for your support and thoughtfulness expressed on the recent passing of my father, Chet Swanson.

Terry Swanson

Retirees

The following JPL employees retired in October:

Dan Bathker, 40 years, Section 920; Richard Coffin, 37 years, Section 101; Moktar Salama, 33 years, Section 352; Allan Klump, 30 years, Section 341; Jack Mondt, 30 years, Section 346; Donald Ebbeler, 23 years, Section 311; Elma Reynolds, 23 years, Section 341; Jack Brock, 17 years, Section 366; Robert Hamell, 17 years, Section 335; Robert Glass, 14 years, Section 311J; Barnwell Legge, 13 years, Section 311J; Wade Mayo, 13 years, Section 331.

Classifieds

For Sale

AIR CONDITIONER with heating unit, exc. cond., needs a 220 line, used until central air was installed, \$150/obo. 626/449-3699.

AIR COOLER, evaporative, horizontal and down discharge, used for approx. 5 years to cool an 1,800 sq. ft. home, \$200. 626/359-7668.

ANSWERING MACHINE, Panasonic KX-TM100B, digital, black, in box, \$10. 310/659-4388.

APPLIANCES: convention oven, nearly new, \$400; dishwasher, \$150; refrigerator, tan, \$150; wall oven, white, \$100; water heater, 50G, originally installed in '94, still has five years on warranty, \$400/obo. 352-0972.

AVIATION TRANSCIEVER, Narco 830 and charger, handheld, needs battery, \$50. 353-9367, evenings and weekends.

BACKPACK, children's, external frame, circa mid-70s, good cond., total frame height 27", shoulder strap height 19", pictures and

further details available, \$10. 249-4603.

BEDROOM SET, California King water bed, wave-less mattress; 6 drawer pedestal, 45" tall bookcase headboard with stained-glass lighted cabinets and stained-glass accent arch mirror; matching bedspread, nightstand and chest of drawers, 56" tall, both with stained-glass doors, \$1,100. 790-4028.

BIKES, 2 boy's, 20", 6-spd., dual suspension, like new, \$50 each. 626/797-6982.

BIKE, 415 FSX BMX, very rugged construction, 4130 chrome frame, 20" wheels, Alex rims, 3-piece crank set, gyro for bar spins, exc. cond., original price \$430, sacrifice for \$210. 790-4028, Daryl.

BOOTS: Niccona lizard skin, western, blk., size 10 1/2, \$25; Justins, medium tan, sz. 10 1/2, \$20; TABLE TOP, oak, Victrola, 1916, \$400; FLOOR RADIO, Victor, hand crank, circa 1926, needs repair, \$200. 248-5282.

CAMPGROUND MEMBERSHIP at Ridgeview Resort RV, in Bullhead City, AZ, near Laughlin, shuttle service available to casinos, \$2,000. 626/335-7345.

CART/DESK, O'Sullivan model 61925, for computer, mobile, cherry veneer, exc. cond., bought for \$120, sell for best offer. 626/449-0997.

CHINA, Lenox, eternal and matching crystal sherbets and goblets, platinum rim, 5-piece service for 12 + meat platter, 2 vegetable bowls, gray boat, used once, some with labels, new, retail \$3,300, discount \$2,045, sell for \$950; DESKS & CHAIRS, Ethan Allen, like new, \$200 and maple, \$60; END TABLE, Ethan Allen, \$50; CHEST, Bombay, \$200. 790-5643.

COFFEE MAKER, Braun, 10-cups, white/black, like new, \$30/obo. 626/791-6101.

CORNINGWARE, in sealed boxes, \$10 per box; MILK CAN, tole painted, \$40. 626/449-3699.

DESK AND CHAIR, Trestle, matching, captain's writing style, solid maple, 44" x 25", with plate glass top, exc. cond., \$199. 626/791-9154.

DIGITAL CAMERA, Olympus Camedia C-5050, 5 megapixel, top rated by PC Magazine June 2003, retails for \$700 plus tax, lots of features plus great auto modes, brand new in box with all accessories and USA warranty, \$571. 310/659-4388, David.

DOG, Doberman puppy, male, very affectionate, needs attention & loving home, 9 mo. old, can't keep much longer. 909/945-5527.

DOG HOUSE, Dogloo XT, for small dog, up to 45 lbs., good cond., \$35. 626/303-1927.

DOG KENNEL, Petmate, VariKennel, size xlg., for full-size dog, 39" x 29" x 27", door is 23" x 19", door and side vents are chrome plated steel, basically brand new, used indoors for only about 3 weeks, pictures and further details available, \$100. 249-4603.

FURNITURE: baby crib, white, with mattress, \$99; dresser, white, \$49; bassinet, attachment for Trend Traveler playpen, \$10; office chairs, slate blue upholstery with oak arms, \$99; desk chair, matching blue high-back swivel, \$59; recliner, teal, \$49; porch chair, large, white, wicker, with arms, plus matching side table, \$29; bike. 626/798-4510.

HOCKEY TICKETS, Kings, two, season ticket holder selling individual games for lower bowl, \$100. 626/852-0821.

KITCHEN TABLE SET, oak, leaf and 6 upholstered chairs, \$125. 626/447-6423.

LAWN MOWER, Murray, 4.0 HP, runs well, \$50; BICYCLE, old Schwinn, 10 spd., \$10, can deliver locally. 952-2192, Tom.

MICROWAVE, Sharp, 1,200 watt, \$45. 661/296-3547.

MISC: ham radio home-brew transmitter & power supply, c. 1940, \$39; donut spare tire/wheel, (1105 80d-13, used once, \$39; mas-sager, Shiatsu, fits in chair, \$39; wireless intercom set, \$39; 2 add-on seatbelt sets, \$25; golf ball retriever, telescoping aluminum 12', \$19; kid's rolling duffel bag, multicolor, never used, \$19; luggage set, Pierre Cardin, 3-piece, \$19; turntable with amp & speakers, \$15. 626/798-4510.

MOVING SALE: office desk, high-quality; computer desk with pullout table; desk with drawer, all 3 pieces \$90. 790-0815, after 5pm.

MOVING SALE: bookcase, all wood, holds TV, \$70; entertainment center, \$55; desks, \$35, \$20; recliner, sofa & love seat, \$600; queen size bed and mattress, wood, almost new, \$500; audio electronic equipments and misc. furnitures and lamps, \$5-\$15. 626/799-7593.

PIANO, Yamaha C3, grand, 6 ft., polished ebony, exc. cond., MSRP \$32,495, sacrifice for \$11,000. 790-3899.

PLAYHOUSE, Fisher Price, children's step 2, 4' by 5', great shape, \$75; swingset, w/2 gliders, 2 swings, padded legs and monkey bar, \$100. 626/447-6423.

PRINTER, COPIER & SCANNER, 3 in 1 Work Center XK35c, makes scanning or copying documents & books easy with a 30-bit color & 300 x 600 dpi resolution, scan function produces clear color scans & sharp text reproductions, includes color & black ink cartridge, \$50/obo. 909/518-0998.

SCANNER, Microtek Scan Maker X6EL, PC or Mac compatible, scans up to legal size plus photo slide or negative scanner, Photoshop 4.0 LE and OCR software, used only a few times, \$30. 626/303-1927.

TELEVISION, Magnavox 25" and 4 head VHS VCR with remote, \$75; TV, home theater model, RCA, 27" w/remote, \$100; STEREO, JVC, model HR-VP606U; VCR, VHS, w/remote, \$50. 790-3991, evenings, Dick Turner.

TV, Philips, model 14RF50S141, 2002, 14", with remote, exc. cond. \$150. 626/644-3796.

TREES, red banana plant, 5' tall, \$60/obo; fish

(ST7-DRS) Project, which is designed to validate and test advanced technologies for future use on NASA's missions that have never been flown in space.

The lab will also be used as part of NASA's Aerospace Technology Enterprise Program to test a miniature xenon ion thruster in the future.

The LISA and ST7-DRS missions, which require a drag-free operation with microthrusters opposing solar pressure, will challenge technology development and verification including performance, contamination and lifetime testing, while the miniature xenon ion thruster will enable the formation of flying control for space interferometers, explorers and probes.

Although the lab just opened, it's currently working on its first operation of the test chamber and will begin the testing of the microthruster next month.

tail, 6' tall, \$80/obo; ficus, 10' tall, braided, in 30" plastic pot, \$250/obo; ceramic bowl, gray, 2' diameter with planted geraniums, \$40/obo. 626/791-6101.

WHEELCHAIR CARRIER, good cond., paid \$2,000, now \$750; hand controls, \$150; show-er chair, \$20; walker, \$20. 626/968-6024.

Vehicles/Accessories

'86 BUICK Century, limited ed., V6 3.8-L eng., only 65K mi., passed smog Mar. '03, well maintained, \$1,300. 626/914-9695.

'95 FORD Taurus LX wagon, top-of-the-line, exc. cond., deep green/beige leather, moonroof, remote entry, cruise, pwr. seats, auto temp. control, 57K mi., \$6,250. 626/798-2925.

'02 HONDA Shadow Spirit 750, yellow, aftermarket rear light and turn signals, sissy bar, only 600 mi., must sell, 3 helmets included, \$5,200/obo. 626/791-5498, Joe.

'96 HONDA CBR 600 F3 motorcycle, 6,100 mi., exc. cond., white, red and black, never down, with matching helmet, thermal cover, tank bra and cargo net, \$4,100. 909/948-9942.

'95 HONDA Accord EX, 2 door coupe, 80K mi., blue-green, automatic, clean, loaded, exc. cond., \$8,300. 952-8455.

'89 HONDA Accord LX 4-door, 63K gentle mi., automatic, 1 owner, all records, excellent maint., silver w/maroon interior, no wrecks, air, power windows, am/fm/cass., \$3,300/obo. 626/797-6824 or 714/538-3763.

'93 JEEP Grand Cherokee Laredo, white, 4.0L, 6 cyl., 4wd, good cond., \$4,300. 957-8463.

'90 JEEP Cherokee 4WD, white, 2 door, 4.0L, 6 cyl., 5 spd., manual, ps/pb/tilt, a/c, roof rack, 145K mi., clean body, runs strong, \$3,100/obo. 648-4846, Mike.

'92 LEXUS ES-300, champagne, leather seats, sunroof, power everything, 107K mi., runs great, some cosmetic dings, \$5,500/obo. 310/659-4388.

'93 MERCEDES, E-300, 6 cyl., 3.0 L, auto, 133K mi., hunter green metallic exterior, cream leather interior, custom sound system, a/c, power windows, alarm, garage kept, owner has service records, vg cond., beautiful drive, \$7,500/obo. 626/797-6824.

'93 NISSAN 240SX, blk., 2 door w/hatchback, 146K mi., good cond., orig. owner, all records, \$2,700. 248-0258.

'92 PLYMOUTH Grand Voyager, charcoal gray, 3.3L, V6, good cond., runs well, \$1,850. 957-8463.

'98 TOYOTA Avalon, white, 4 door, a/c, CD, alarm, Lo-Jack, good cond., 91K mi., \$7,700. 626/319-5466.

'98 TOYOTA Celica GT, liftback, 2 door, white, grey cloth interior, 5-spd., manual, premium pkg., pwr. locks/windows/sunroof, tinted glass, alarm, exc. cond. and fun to drive, 57K mi., \$10,500. 662-5671, Brian.

'01 VOLVO S40, midnight blue/black, loaded, am/fm stereo/CD/cass., pwr. doors and windows, beautiful leather interior, 1 owner. 323/445-5342, Alex.

'00 VW Jetta, 1.8T turbo, blk. w/ blk. leather, 6 CD, moonroof, 5-spd., loaded, very clean, like new, serviced regularly, 56K mi., moving, must sell, \$12,000/obo. http://shard.servebeer.com/~iceman/jetta/jetta.html. 626/744-9941, night.

'89 WINDCRUISER Itasca, 32' class A motorhome, 22K mi., GMC 30 chassis, 454 w/Banks power pack, generator, queen bed island, 3-way appliances, 2 rooftop a/c, TV, VCR, antenna, connections for cable/satellite, back-up CCTV, leveling jacks, tire pressure warning system, hitch receiver, lots of storage, very clean, \$22,000. 626/335-7345.

'98 ZIEMAN trailer, commercial, single-axle, electric brakes, pwr. winch, torsion bar suspension, tilt bed, exc. cond., \$1,500/obo. 626/793-3393.

Free

BIKE, 10-spd., c. 1973, needs to be restored. 626/798-4510.

DOG, Licorice, to a good home, great dog, medium size, short blk. hair, virtually no shedding, was a stray, super loving, intelligent, great with children of all ages, has shots and is spayed, would make a great watch and companion dog, needs a backyard and love, will re-claim if it isn't a good fit. 957-0743, Karen.

FENDERS, for VW Bug, one front, one rear. 626/797-6982.

Wanted

FEMALE SINGER for garage band, avg. band age is 35, originals, classic/hard rock, Beatles, blues, reverb2020@yahoo.com.

GUITARIST, classical music, interested in playing duets. jfz@alumni.caltech.edu, Jim.

HOUSE KEEPER/BABYSITTER, part time, Mon. to Fri. 4-8 pm, must spk. English or Amharic, duties include cooking, light housekeeping, and baby-care, baby boy approx. 1 yr. old, references required, \$10/hr. 626/791-2035.

TUTOR for math, jr. & sr. high school level classes, geometry, algebra I/II, SAT math. 888/784-1639, David.

SPACE INFORMATION/memorabilia from U.S. & other countries, past & present, for personal use. 790-8523, Marc Rayman.

VANPOOL RIDERS, permanent & part-time seats avail. on vanpool #3, originating out of Fontana w/stops in Rancho Cucamonga and La Verne; arrive at 6:45, depart at 3:45; cost is \$140/mo. for permanent riders (\$90 after \$50 monthly subsidy for JPL employees), \$7/day for part-time. Rhea Clearwater, ext. 4-5831 or Mike Taylor, 4-8343.

VOLLEYBALL PLAYERS, co-ed, no beginners please; Tues. nights 8-10:00 at Eagle Rock High School; \$4/nt. 956-1744, Barbara.

For Rent

ALTADENA house, 3 bd., new paint inside and out, newly plumbed, carport, fireplace, water, gardner and trash pickup paid for, near JPL north of Woodbury & east of Lincoln, \$1,700. 323/871-1043, Kathleen.

ARROYO house, min. from JPL, charming 3 bd., with h/w floors, fireplace, cent. a/c & heating; spacious living & dining rooms + lg. detached rm.; beautifully landscaped front and back yards; incl. stove/oven, refrigerator; quiet & safe neighborhood; \$1,950. 760/451-8500.

LA CRESCENTA area, 1-bdrm. house, \$1,000. 248-3640.

PASADENA, Caltech staff member seeks non-smoking, cat-friendly roommate to share 2 bd., 2 ba. condo 3 blocks from Caltech; unfurn. bd. & ba.; central air/heat, fireplace, 3rd fl. north-facing balcony, laundry and parking; walking dist. to Old Town, Goldline metro & more; 6-mo. lease, \$1,000 + 1/2 gas and electric + \$1,000 security deposit. 626/833-2961, Jane.

PASADENA, spacious 2-story condo, 3 beds, 2.5 baths, prestigious community, beaut. inter., bright ktch., prof. landscape, ctrl. air & heat, close to shop., cozy LR w/F/P, end unit, frml DR, hdwd. flrs., immac. cond., close to schls. \$1,750. 626/396-9024.

PASADENA townhome-style apts., furn. & unfurn., 2 bd., 1.5 ba., patio, dishwasher, cent. a/c, new carpet & floors, refrigerator & stove, laundry, parking, close to Caltech & JPL, \$1,295-\$1,350 + util. 626/577-3060, ext. 14, Dennis.

PASADENA apt. to share w/JPLers, furnished, 3 bd., 3 ba., townhome-style, patio, central a/c, laundry, close to Caltech & JPL, \$650 + utilities. 626/577-3060 ext 14, Dennis.

PASADENA townhouse, lg., 3 bd., 2.5 ba., centr. air & heat, washer/dryer hookups, fireplace, walk to Goldline station, new carpet, linoleum, stove, covered parking, no smoking or pets, water & trash incl., \$1,800. 626/394-5946.

SIERRA MADRE townhouse-style apt. to share, 1,000 sq. ft., lg. patio, 2 bd., 1.5 ba., quiet street, garage parking, washer/dryer for this unit, \$605 + 1/2 util. 626/355-4838.

SUNLAND room in condo, fully furn., share kitchen/bath/laundry; garage parking, a/c, fireplace, pool, Jacz., tennis court; 10 mi./JPL, female preferred, non-smoking, \$500 incl. util., \$400 security deposit, references. 352-3112.

TUJUNGA duplex on cul-de-sac, lg., 2 bd., 1 ba., stove, front unit; new paint, carpet & a/c; approx. 15 min. to JPL, nicely landscaped, washer/dryer hookups, no pets, \$1,250. 352-4669.

WOODLAND HILLS, room in quiet home, separate bath and phone line, high-speed internet, kitchen and laundry privileges, non-smoking, utilities included, \$400. 710-7694.

Real Estate

ARKANSAS, Ozarks home, 4 bd., living rm., dining rm., deck w/lake view, fireplace, n. lake w/fishing/boating/swimming, nr. golf course, home on 3 wooded lots, 30 min. from Branson, Mo., \$100,000/obo. 626/449-3699.

Vacation Rentals

BIG BEAR LAKEFRONT, lux. townhome, 2 decks, pool/spa, tennis, beautiful master bd. suite, slps. 6. 949/786-6548.

CABO SAN LUCAS, Valentine's wk. getaway, junior suite at Pueblo Bonito Resort, slps. 4, balcony w/panoramic vw. of Sea of Cortez, kitchenette, a/c, satellite TV, on white sand beach, lg. fireproof pool w/island & waterfall, fitness ctr., 2 restaurants, deli, beauty shop, maid service, bilingual staff; 80 F ocean temp, \$800 for wk. of 2/09/04, www.pueblononito.com. 626/296-8633, Todd.

COLORADO RIVER home in Ehrenberg, AZ, Redman, 1985 mobile, 14' w x 48' L, (2 bd., 1 bath), full length (48') extra wide metal awning (14' + 2' bent poles for great access), 3/4 cement patio/driveway, Tuff Shed barn, 9' x 12,' forced heating (a/c ready), 2 window a/c's & 1 swamp cooler, 10 minutes from Blythe, \$27,500/obo. 626/916-0665.

DEL MAR condo, fully furn., 7 nights, 11/15-11/22/03, sleeps 6, 2bd., 1 & 1/2 ba., living room, full kitchen, cable TV/VCR, game room, sauna, pool/spa, laundry room, BBQ area, walking to race track and beach, JPL discount. 626/961-8771.

HAWAII, Maui condo, NW coast, ocean front view, 25 ft. fr. surf, 1 bd. w/loft, complimentary furniture, phone, color TV, VCR, microwave, d/w, pool, priv. lanai, sleeps 4, laundry facility, low season rate \$105/nite/2, high-season rate \$120/nite/2, \$15/nite/add'l person. jackandrandy@cox.net or 949/348-8047.

MAMMOTH, Snowcreek, 2 bd., 2ba., +loft, slps. 6-8, fully equip'd kitchen incl. microwave, D/W, cable, VCR, phone, balcony w/mtn, vw., Jacz., sauna, streams, fishponds, close to Mammoth Creek, JPL disc'nt. 626/798-9222 or 626/794-0455 or valerie@gps.caltech.edu.

OCEANSIDE condo, fully furn, 2 bd., 2 ba., fireplace, full kitchen, quiet, relaxing, beautiful beachside setting; BBQ, pool, spa, game room, great ocean view; easy walk to pier & restaurants, slps. 8, avail. weekly or monthly, 909/981-7492, Darlene, or dfhauge@yahoo.com.

OCEANSIDE condo, on the sand, charming 1 bd., panoramic vw., walk to pier and harbor, pool/spa, game rm., slps. 4. 949/786-6548.

ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach, on private road., 18-hole golf course 6 mi. away, private, secure parking. 626/794-3906.

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